# United States Patent [19]

**Funke**

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[54] **SKI POLE ASSEMBLY**


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[73] Assignee: **ISPOW AG**, Chur, Switzerland



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[51] **Int. Cl.²** ..... **A63C 11/24**

[58] **Field of Search** ..... 280/11.37 N, 11.37 Z, 280/11.37 P, 11.37 H, 11.37 B, 11.37 L, 11.37 F; 135/81, 80, 70, 77



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[57] **ABSTRACT**

A ski pole assembly in which a snow engaging disc or like member near one axial end of the ski pole is biased toward a rest position by a resilient tubular mounting member, approximately coaxial with the pole and having respective axial parts fastened to the main portion of the pole and the snow engaging member respectively. The snow engaging member covers the free end of the pole in its rest position only.


**15 Claims, 5 Drawing Figures**

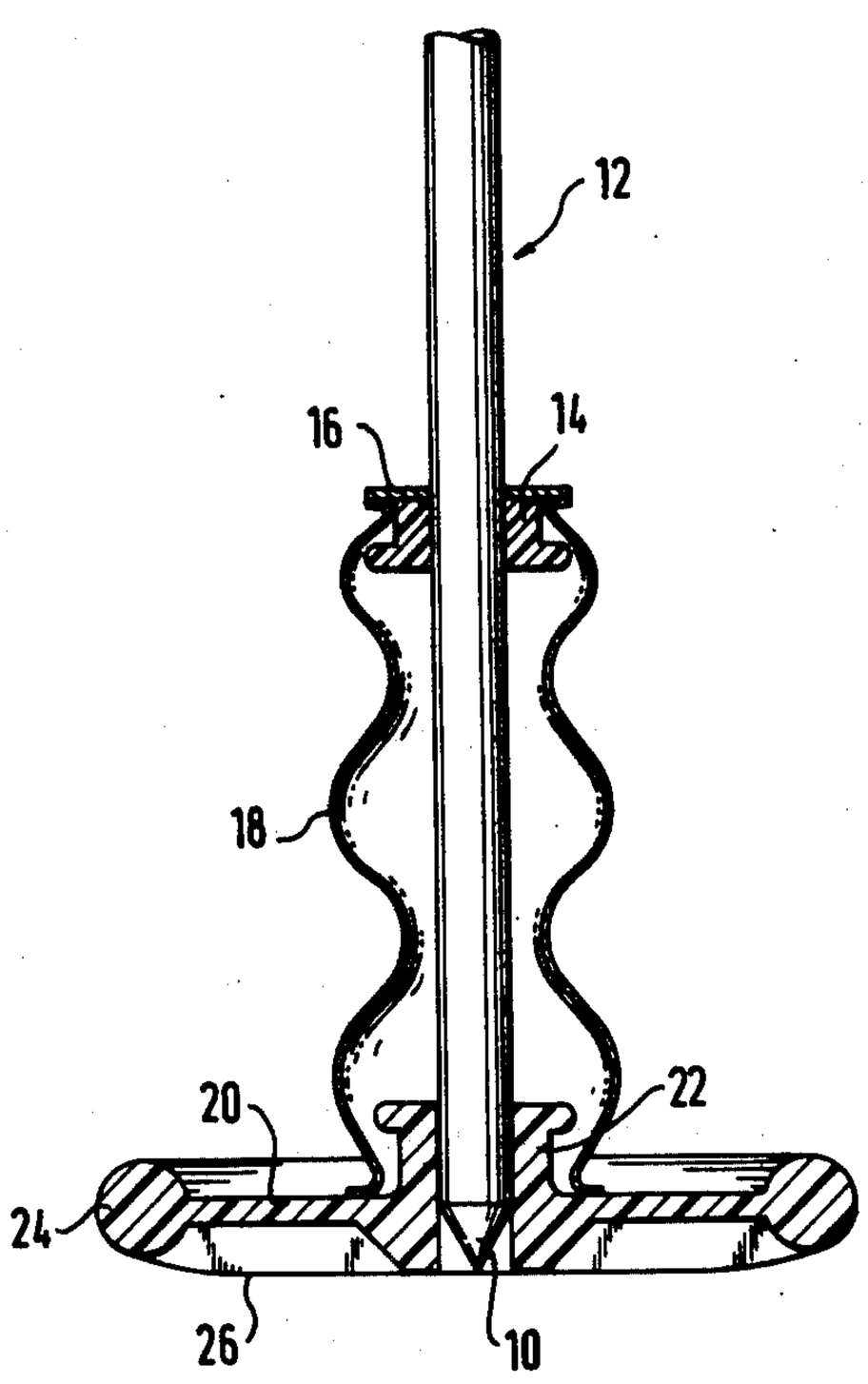

Fig.1

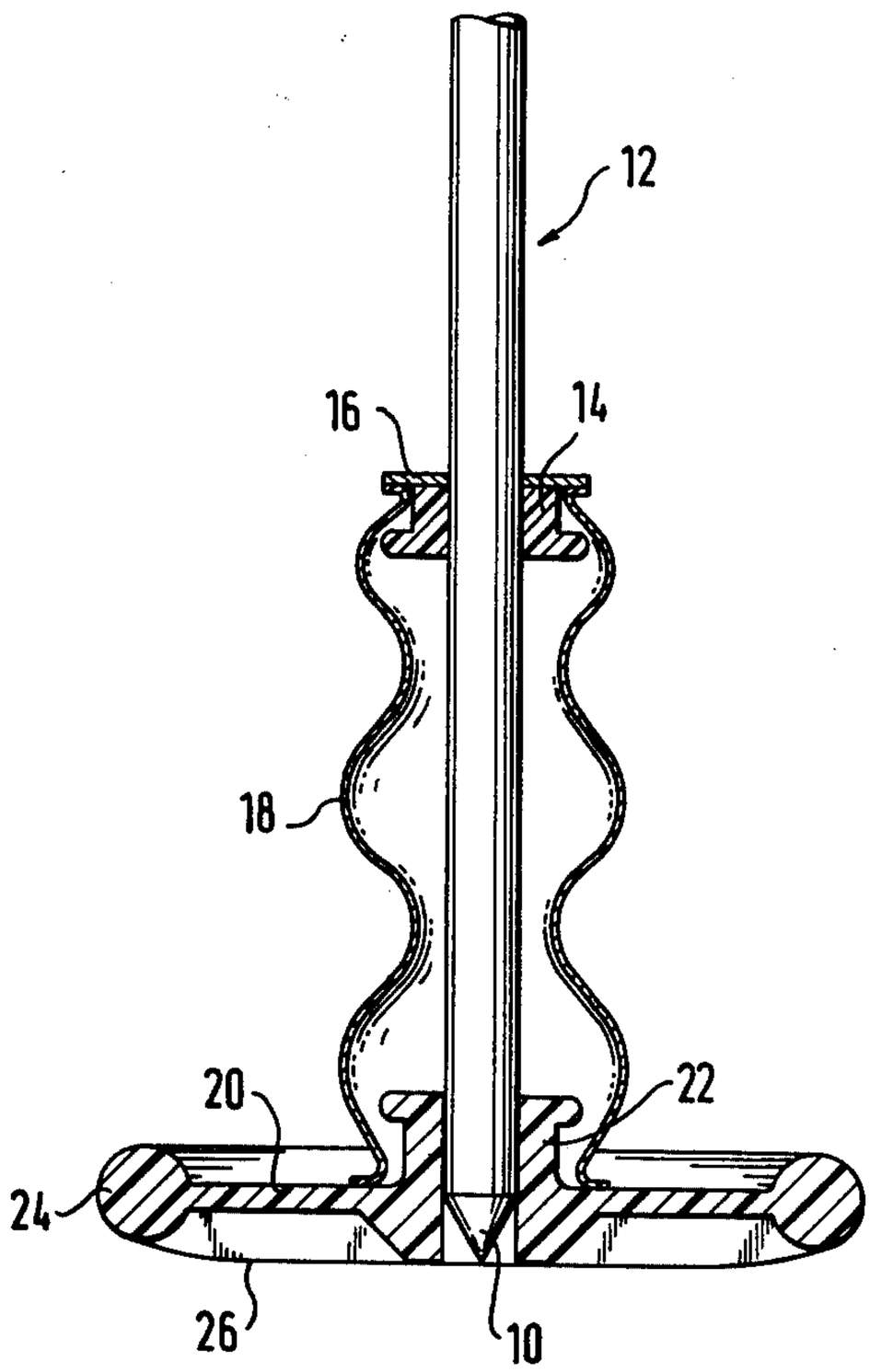

Fig. 2A

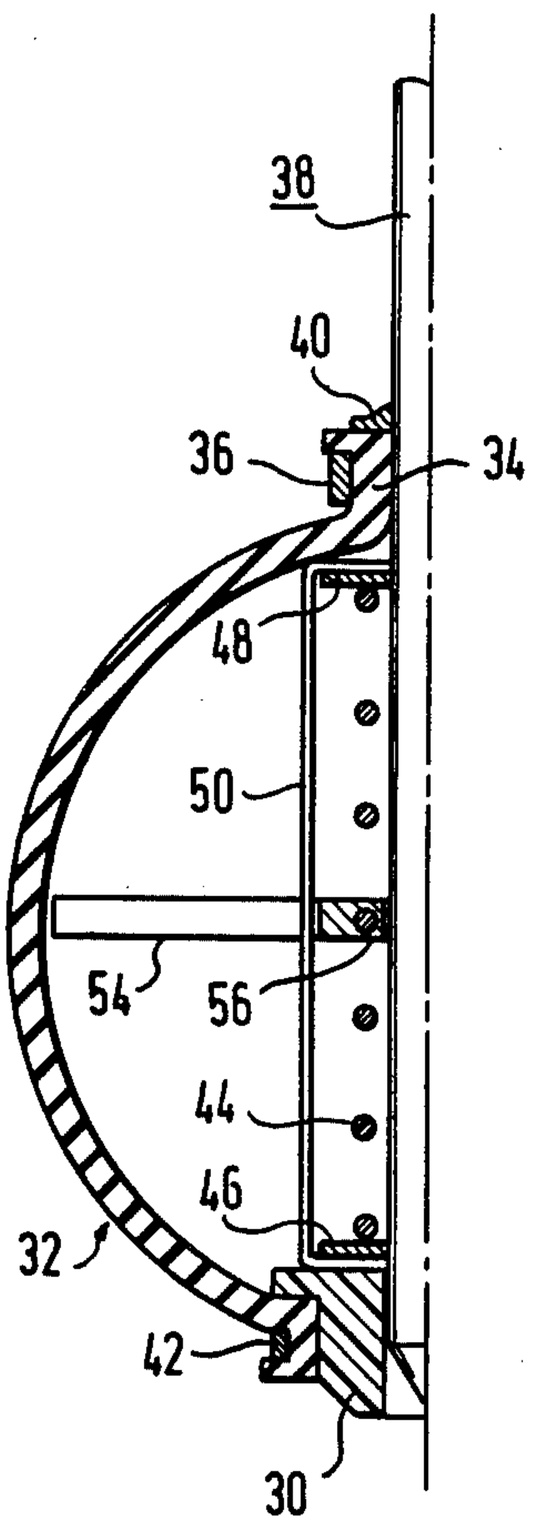
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Fig. 2B

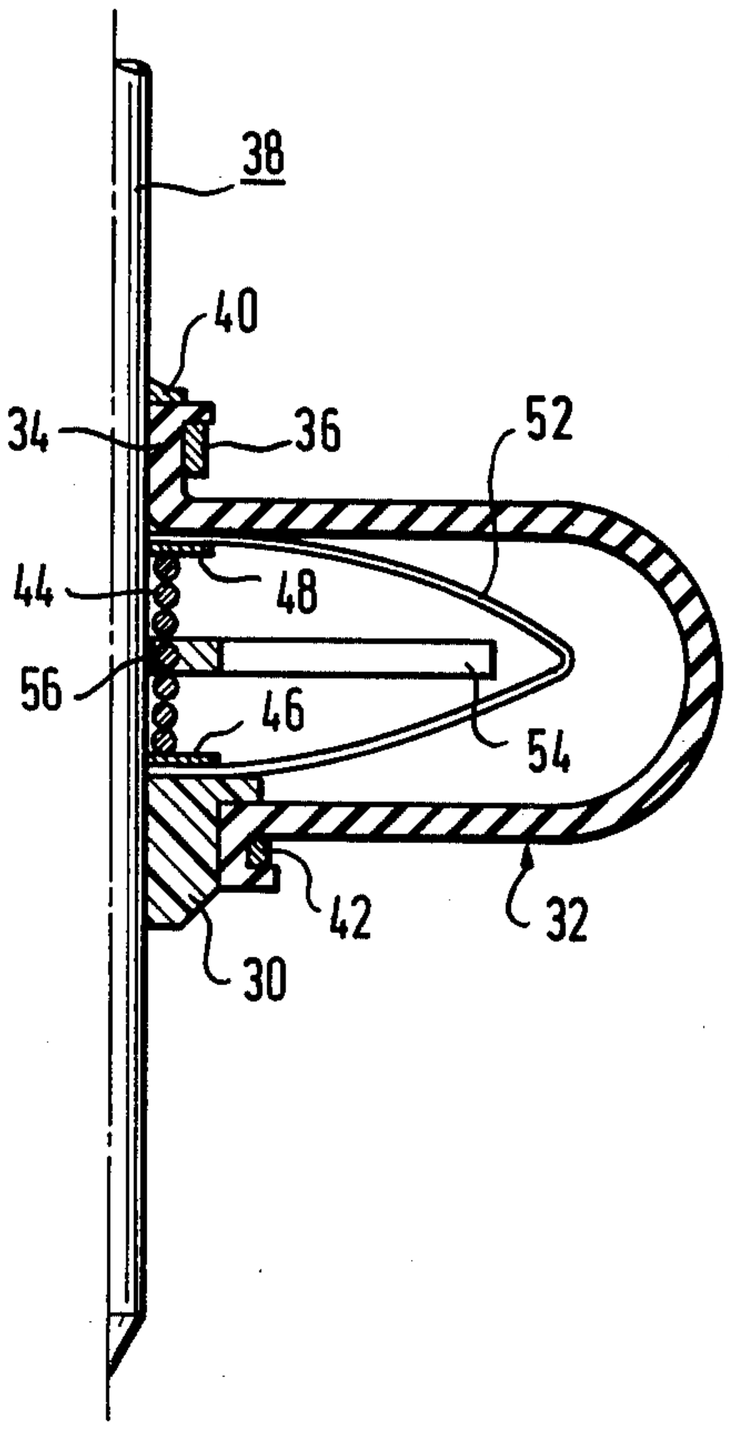
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Fig. 3

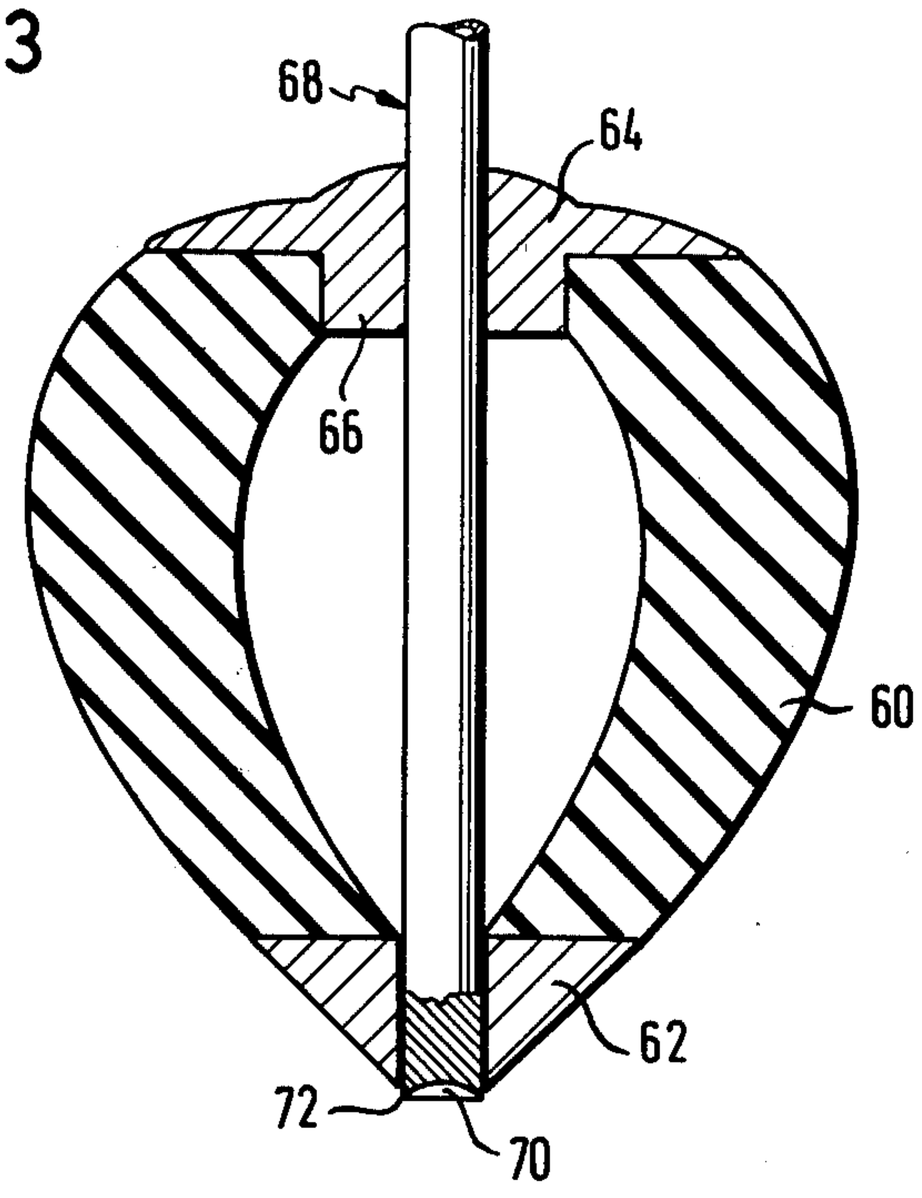
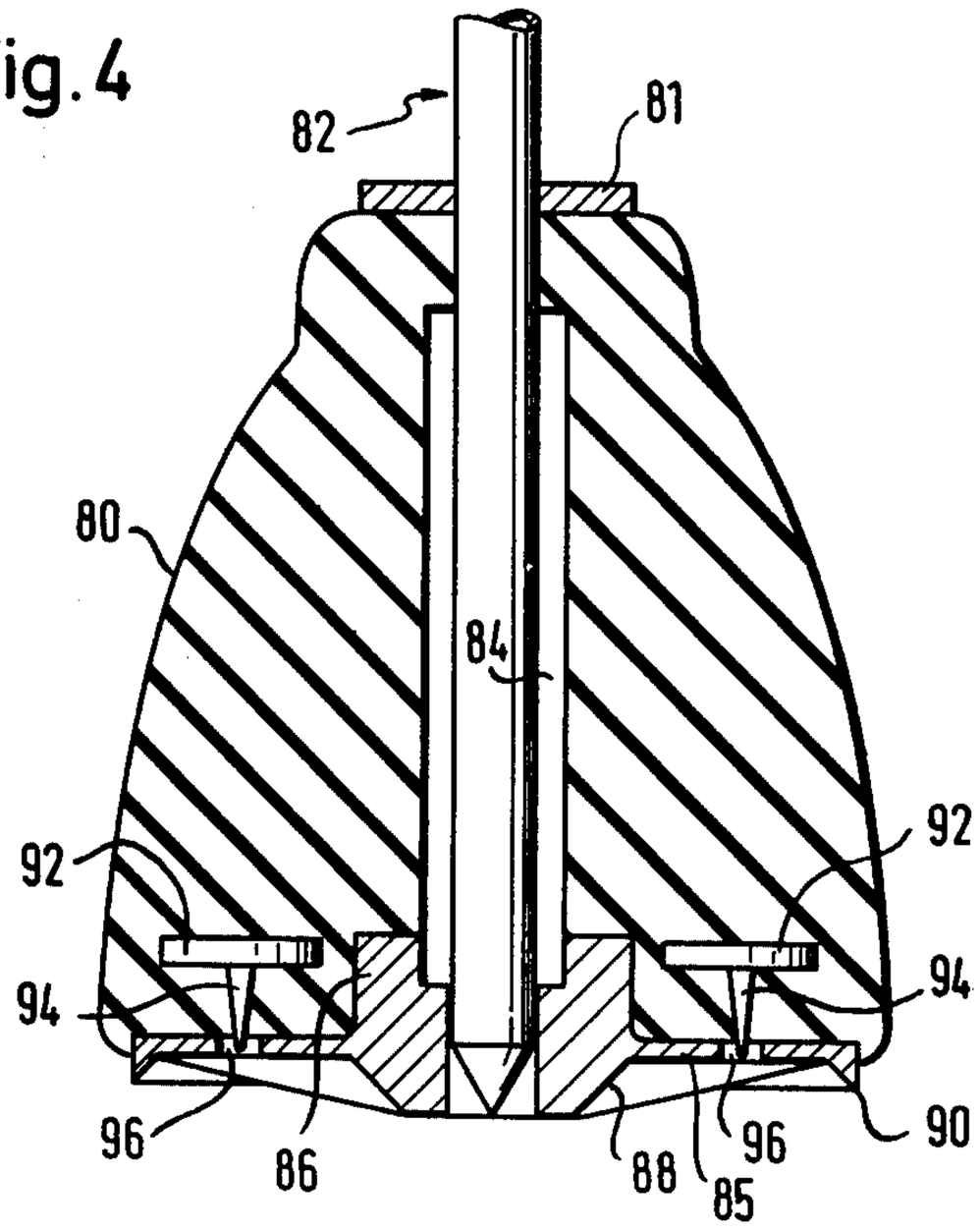



Fig. 4



# SKI POLE ASSEMBLY

This invention relates to ski poles, and particularly to a ski pole assembly in which the free end of the pole member is automatically covered to prevent it from injuring people when not in use.

Known ski pole assemblies with automatically protected pole ends rely on relatively heavy devices which themselves are not always free from sharp corners or edges that may cause injury. It is a primary object of this invention to provide a ski pole assembly in which accidents caused by the free operating end of the idle ski pole are safely avoided by an arrangement which does not materially add to the weight of the pole assembly and is itself free from potentially dangerous sharp points, edges, or corners.

With this object and others in view, as will presently become apparent, the ski pole assembly of the invention includes a snow engaging member having a snow engaging face and formed with an aperture therethrough, and a yieldably resilient, tubular mounting device which receives a part of the pole therein and secures the snow engaging member to the pole for axial movement relative to the pole between an operative position and a rest position. The main portion of the pole and its free end portion project from the aperture in the snow engaging member in opposite axial directions when the snow engaging member is in its operative position, and the snow engaging member is offset from the operative position axially away from the main portion of the pole when in the rest position. The mounting device biases the snow engaging member toward the rest position.

Other features, additional objects, and many of the attendant advantages of this invention will readily be appreciated as the same becomes better understood from the following detailed description of preferred embodiments when considered in connection with the appended drawing in which:

FIG. **1** shows a ski pole assembly of the invention in fragmentary elevational section on the pole axis;

FIG. **2A** shows another embodiment of the invention in corresponding, fragmentary, elevational section with its snow engaging member in the rest position;

FIG. **2B** illustrates the device of FIG. **2A** in the operative position of its snow engaging member; and

FIGS. **3** and **4** show additional aki pole assemblies of the invention in respective views analogous to FIG. **1.**

Referring initially to FIG. **1,** there is shown the free lower end including a conical point **10** and the lower part of the tubular main portion **12** of an aluminum ski pole. The upper part of the generally cylindrical main portion **12** has been omitted from FIG. **1** since it may be entirely conventional, a loop or strap of leather or like material being attached to the nonillustrated upper end of the pole.

A plastic collar **14** and a metal washer **16** are fixedly fastened to the outer face of the main pole portion **12.** The washer provides an abutment for tubular aluminum bellows **18,** coaxial with the pole portion **12,** and the collar prevents movement of the bellows away from the washer. The other, annular end of the bellows **18** abuts against an annular disc **20** whose hub **22** slidably receives the lower end of the pole. A collar on the hub **22** prevents release of the disc **20** from the bellows **18.** The disc **20** has an integral, toroidal rim **24** and radial



ribs **26** connecting the rim **24** to the hub **22** for adequate strength.

In the illustrated rest position of the disc **20,** the bellows **18** is in the relaxed condition. When the pole assembly is placed on a snow surface, and the skier's weight is partly transmitted to the pole, the lower radial face of the disc **20** engages the snow and impedes sinking of the disc in the snow while the bellows **18** is axially compressed and the point **10** is pushed outward of the central aperture of the disc **20** to penetrate the snow. When the pole is lifted from the snow, the axially expanding bellows **18** causes the disc **20** to revert to the illustrated rest position in which the point **10** is retracted inward of the orifice in the bottom face of the disc **20.** Full protection from injury by the point **10** is afforded, for example, while the pole assembly is being carried to or from a slope on the skier's shoulders.

The weight of the ski pole assembly shown in FIG. **1** differs from that of an otherwise conventional assembly with fixed snow engaging disc only by the added weight of the bellows **18** which is negligible compared to that of the other assembly components. The exposed, imperforate, outer face of the flexible, smoothly contoured bellows cannot itself cause injury, its edges being covered by the washer **16** and the disc **20.** The washer **16** is attached to the pole portion **12** by a spot weld, not shown, but all other elements shown in FIG. **1** are assembled without tools by snap fits.

Materials of construction other than those described with reference to FIG. **1** may be employed in the ski pole assembly of the invention, and their nature may call for structural modifications of the type illustrated in the other Figures of the drawing.

The ski pole assembly shown in FIG. **2A** in the rest position of its snow engaging member and in FIG. **2B** in the oerative position includes a pole **38** which is identical with the lightmetal pole described with reference to FIG. **1.** Its pointed free end is retracted in FIG. **2A** into the bore of a plastic bushing **30** whose upper end carries a radial flange whereas the lower end tapers conically downward. The bushing **30** is received in one of two diametrically opposite openings of a rubber ball **32** whose rims carry integral reinforcing rings **34.** The lower reinforcing ring of the ball **32** is fastened to the bushing **30** by a metal clamp **42.**

The upper reinforcing ring **34** is held in tight engagement with the main portion of the pole **38** by a metallic clamping ring **36,** and its axial movement relative to the pole is further prevented by axially abutting engagement with a fixed metallic collar **40** on the pole **38.** The elastomeric ball **32** is biased toward the rest position shown in FIG. **2A** by a helical compression spring **44** coaxially enveloping the pole **38** in the cavity of the ball **32,** and axial expansion of the ball beyond the position of FIG. **2A** under the pressure of the spring **44** is prevented by a flexible strap **50** one end of which is clamped between a washer **46** movably mounted on the pole **38** and the bushing **30,** while the other end is clamped between a corresponding washer **48** and the upper reinforcing ring **34,** the clamping pressure being provided by the spring **44** which is seated on the washers **46, 48.**

Radial collapse of the ball **32** is prevented by an approximately star-shaped, annular disc **54** which slidably receives the pole **38** in its central apertures. The strap **50** passes through one of the several notches which extend radially inward from the outer circumference of the disc **54.** The central part of the disc **54** is

fastened to a turn **56** of the spring **44** which is axially equidistant from the washers **46, 48.**

FIG. **2B** shows the same ski pole assembly in the shape assumed when the bushing **30** engages a snow surface and weight is applied to the pole **38.** The pressure of the snow flattens the ball **32** into the shape of a body of revolution having planar, radial top and bottom faces connected by a toroidally arcuate bulge. In the limiting position shown in FIG. **2B,** further axial compression of the ball **32** is prevented by abutting engagement of the several turns of the spring **44.** The strap **52,** identical with the strap **50,** is folded outward of the notches in the disc **54.** The strap may consist of glass-fiber reinforced plastic or other flexible material of high longitudinal strength.

The snow engaging, lower radial face of the ball **32** is enlarged by the pressure axially applied to the pole **38.** This advantageous feature is achieved at least to some extent in the lighter and structurally simpler embodiment of the invention illustrated in FIG. **3.**

The pole **68** is slidably received in a snow-engaging, light-metal bushing **62** of approximately conical shape. A flanged, coaxial plug **66** is fixedly mounted on the main portion of the pole **68,** and tubular rubber body **60** having the approximate shape of a pear in the relaxed condition illustrated in FIG. **3** is vulcanized to an annular, radial face of the flange **64** on the plug **66** and to the radial base of the conical bushing **62.** The wall thickness of the body **60** decreases gradually from the flange **64** to the bushing **62.**

The free lower end of the otherwise tubular pole **68** is solid and has a transverse end face **70** which is approximately spherically concave. The end face merges with the uniformly cylindrical, outer, axial face of the pole **68** in a circular edge **72** which is acutely angular in cross section in a plane through the axis of the pole, as is shown in FIG. **3.** The edge **72** is analogous in its snow holding properties and in its ability of causing injury to the conical point illustrated in the other figures of the drawing, and the two configurations of the free pole ends are interchangeable in all illustrated embodiments of the invention.

When the ski pole assembly shown in FIG. **3** is pressed against a snow surface, the rubber body **60** is axially compressed, thereby causing the free pole end to project downward from the aperture in the bushing **62.** The compressive stress causes spreading and flattening of the thinner-walled part of the body **60** near the bushing **62** to provide an approximately radial snow engaging face. The heavy-walled upper part of the body **32** undergoes less deformation and tends to restore the illustrated rest position.

The ski pole assembly partly shown in FIG. **4** includes a pole **82** identical with the pole shown in FIG. **1** and carrying a fixed annular disc **81** on its tubular main portion. A resiliently compressible, tubular body **80** of elastomeric material coaxial with the pole **82** flares approximately conically from the disc **81** toward a larger, coaxial, circular, metal disc **85** whose central hub portion **88** slidably receives the free end portion of the pole **82** in the illustrated rest position of the disc **85.** The bore **84** of the body **80** is of stepped, cylindrical shape. Only its top portion is dimensioned for firm engagement with the outer face of the pole **82,** whereas adequate clearance is provided elsewhere between the pole **82** and the body **80** so that frictional engagement with the pole cannot impede axial compression of the body **80.**

The disc **85** has an exposed, radial, snow engaging face about the hub portion **88,** and an integral, circular rim **90** of angular cross section prevents warping of the relatively thin metal disc **85** and provides some snow holding action without presenting a significant hazard. The heads of inserts **92** are molded into the material of the body **80.** The inserts have the approximate shape of oversized thumb tacks, and their stems **94** taper from the head toward openings **96** in the disc **85** in which the sharp points of the inserts **92** are retracted in the illustrated rest position of the assembly.

When the lower radial face of the disc **95** is engaged by snow under pressure, the disc **85** is moved axially toward the main portion of the pole **80,** and the resulting axial compression of the tubular body **80** causes the points of the inserts **92** to project from the openings **96** so as to complement the snow holding effect of the pointed tip of the pole **82.**

The hollow, resilient body **80** is preferably made of polyurethane foam whose light weight and resiliency make it particularly suitable for the purpose of this invention. The polyurethane is foamed in a mold whose cavity is partly bounded by the disc **81,** the rod **82,** and a removable cover carrying the inserts **92** and a core for shaping the wide portion of the bore **84.** The tubular body **80** is thus integrally bonded to the disc **81,** the pole **82,** and the inserts **92.** It may be bonded adhesively to the disc **85,** but other methods of movably securing the disc **85** to the pole **82** by means of the body **80** will readily suggest themselves.

It should be understood, therefore, that the foregoing disclosure relates only to preferred embodiments of the invention, and that it is intended to cover all changes and modifications of the examples of the invention herein chosen for the purpose of the disclosure which do not constitute departures from the spirit and scope of the invention set forth in the appended claims.

What is claimed is:

**1.** A ski pole assembly comprising:

a. an elongated pole member having a longitudinal axis, an axial main portion, and an axial free end portion shaped for axially penetrating a snow surface;

b. a snow engaging member formed with an aperture axially extending therethrough for movably receiving a portion of said pole member,

1. said snow engaging member having a snow engaging face transverse to said axis and directed axially away from said main portion;

c. an axially compressible, resilient tubular mounting member having two axially terminal parts,

1. said terminal parts being annular about said axis and being fastened to said pole member and to said snow engaging member respectively, whereby said snow engaging member is secured to said pole member for relative axial movement between an operative position and a rest position of said snow engaging member,

2. said end portion projecting from said face in the operative position of said snow engaging member,

3. said snow engaging member in said rest position covering said free end portion,

4. said mounting member biasing said snow engaging member toward said rest position.

**2.** An assembly as set forth in claim **1,** wherein said mounting member is a bellows member.

3. An assembly as set forth in claim 1, wherein said mounting member consists essentially of elastomeric material and has the approximate shape of a body of revolution about said axis.

4. An assembly as set forth in claim 3, wherein the wall thickness of said mounting member decreases between said parts thereof toward said snow engaging member.

5. An assembly as set forth in claim 3, wherein said mounting member flares approximately conically from said main portion toward said end portion.

6. An assembly as set forth in claim 1, said mounting member having a bore, a helical compression spring enveloping said pole member in said bore and having respective terminal portions fastened to said terminal parts of said mounting member, said spring biasing said parts axially away from each other.

7. An assembly as set forth in claim 6, a flexible, elongated tension member having respective longitudinal end portions fastened to said terminal parts in said bore and thereby limiting the expansion of said mounting member.

8. An assembly as set forth in claim 1, mounting member having a bore, a disc member projecting radially outward from said pole member in said bore for engagement with said mounting member and thereby limiting radial contraction of said mounting member.

9. An assembly as set forth in claim 1, wherein said mounting member consists essentially of cellular, elastomeric material.

10. An assembly as set forth in claim 1, wherein said mounting member has an exposed, imperforate, outer face extending from one of said terminal parts to the other terminal part.

11. An assembly as set forth in claim 1, further comprising a projection fastened to said face for movement with said snow engaging member between said positions, said projection extending outward of said face away from said main portion in said operative position of the snow engaging member and tapering in a direction away from said face.

12. An assembly as set forth in claim 11, wherein said projection is annular about said axis and spaced radially away from said aperture.

13. An assembly as set forth in claim 11, wherein said snow engaging member is formed with an opening extending axially therethrough and spaced radially from said aperture, said projection being partly embedded in said mounting member in alignment with said opening and projecting from said opening in said operative position of the snow engaging member while being withdrawn inward of said opening in the rest position of said snow engaging member.

14. An assembly as set forth in claim 1, wherein said end portion has a transverse end face of concavely arcuate cross section and an axial face of annular cross section, said faces merging in an edge, said edge being of acutely angular cross section in a plane through said axis.

15. An assembly as set forth in claim 1, wherein said aperture has an orifice in said face, said end portion being retracted inward of said orifice in said rest position of said snow engaging member.

* * * * *